



CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005



Job No.: CTCE/BBMP/W.No.08/MM/CSR-04/008g/CEMENT/2016-17

Date: 11.04.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
* AGENCY	:	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
* NAME OF THE WORK	:	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
* REFERENCE	:	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	09.04.2016
PERIOD OF TESTING	:	09.04.2016 to 11.04.2016



The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	30.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	145 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	485 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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VISHWANATH. I.A.
Chief Executive Officer



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Job No.: CTCE/BBMP/W.No.08/MM/CSR-04/008g/SAND-Gradation/2016-17

: 11.04.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

* Customer : Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.

* Agency : Mr. Murali Mohan,
Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.

* Name of Work : Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 09.04.2016

Date of Testing : 11.04.2016



Total Wt. of Aggregates in gms 1000

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	94.00	90-100	90-100	90-100	95-100
2.36	76.80	60-95	75-100	85-100	95-100
1.18	58.30	30-70	55-90	75-100	90-100
600 Micron	29.30	15-34	35-59	60-79	80-100
300 Micron	14.30	5-20	8-30	12-40	15-50
150 Micron	5.80	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.08/MM/CSR-04/008g/AGG/GR/2016-17

: 11.04.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* Customer : Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
* Agency : Mr. Murali Mohan,
Kodigehalli (V), Sahakaranagara (P), Bangalore – 92.
* Name of Work : Improvements to roads and drain in extension area in Ward No.08, BBMP,
Bangalore.
Reference : EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Technical Reference : IS : 2386 Part 1 -1963 RA-2007
Sample ID : Coarse Aggregates (40mm)
Sample Received on : 09.04.2016
Date of Testing : 11.04.2016



Total Wt. of Aggregates in gms= 7000

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	98.29	95-100	85-100
20	31.29	30-70	0-20
10	17.00	10-35	0-5
4.75	4.86	0-5	

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.08/MM/STEEL/2016-17

11.04.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer : **Asst. Executive Engineer**, Kodigehalli Sub Division,
BBMP, Bangalore.

Agency : **Mr. Murali Mohan**,
Kodigehalli (V), Sahakaranagara (P), Bangalore – 92.

Name of the Work : Improvements to roads and drain in extension area in
Ward No.08, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/22/2015-16 Dated:
20.04.2015

Date of Test : 11.04.2016

Technical Reference : IS: 1786-2008

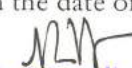


AE-B ✓

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm ²	Tensile strength (Ultimate stress) N/mm ²	Elongation percent gauge length		
1	10	0.62	513	556	13.25	O.K	O.K

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Job No.: CTCE/BBMP/W.No.08/MM/CSR-04/008g/CUBE/2016-17

16.05.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* **Customer** : Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.

* **Agency** : Mr. Murali Mohan,
Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.

* **Name of the work** : Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.

* **Reference** : EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015

* **Sample ID** : Drain Covering Slab Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm²

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

* **Grade of Concrete** : M₂₀

Compressive Strength as on : 28th day

Sample Received on : 16.05.2016



A2-8
2

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm ²)
1	18.04.2016	16.05.2016	8.198	485.5	21.58
2	18.04.2016	16.05.2016	8.265	512.3	22.77
3	18.04.2016	16.05.2016	8.390	526.8	23.41

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12.05.2016

GRADATION FOR WMM MORTH TABLE-400-11

Customer : Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.

Agency : Mr. Murali Mohan,
Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.

Name of Work : Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.

Reference : EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015

Date of Testing : 12.05.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7965

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	210	210	2.6	97.4	95-100
22.4	2500	2710	34.0	66.0	60-80
11.2	1210	3920	49.2	50.8	40-60
4.75	1050	4970	62.4	37.6	25-40
2.36	980	5950	74.7	25.3	15-30
0.600	900	6850	86.0	14.0	8-22
0.075	865	7715	96.9	3.1	0-8

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Job No.: CTCE/BBMP/W.No.08/MM/WMM/AIV/2016-17

12.05.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
Name of the Work	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	12.05.2016



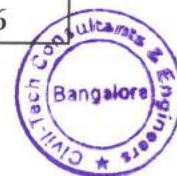
Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	392	22.66
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	303	
4	Aggregate Impact value = percent fines	22.62	22.70	
	$100 * (W_2 / W_1) \%$			22.66

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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12.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
Name of Work	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	12.05.2016



Result : Flakiness Index = 11.98%

Elongation Index = 13.32%

Result : Combined Flakiness & Elongation index 25.30%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.08/MM/SDBC/AIV/2016-17

18.05.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
Name of the Work	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
28.07.2014	18.05.2016



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	383	21.57
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines $100 * (W_2/W_1) \%$	21.47	21.67	

Comments:

Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.08/MM/SDBC/Shape_T/2016-17

: 18.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore – 92.
Name of Work	: Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 18.05.2016



Result : Flakiness Index = **11.10%**

Elongation Index = **13.65%**

Result : Combined Flakiness & Elongation index **24.75%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.08/MM/SDBC/Stripping/2016-17

18.05.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
Name of the work	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	18.05.2016



Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		



Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.08/MM/SDBC/Sp_Wa/2016-17

18.05.2016

Specific Gravity And Water Absorption Test.

IS: 2386 Part III

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
Name of the Work	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
Reference	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	18.05.2016



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2027	2025	2026	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1272	1270	1271	
4	Weight of saturated surface dry aggregate in air	W_3 g	2019	2020	2024	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	747	750	753	
6	Weight of oven dried aggregate	W_4 g	2005	2008	2007	2.676
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.684	2.677	2.665	
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.735	2.721	2.727	
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.70%	0.60%	0.85%	0.71%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.08/MM/SDBC/Bitumen/2016-17

18.05.2016

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX As per IS2386 and IRC:SP:11-1984

CUSTOMER	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	Mr. Murali Mohan, Kodigehalli (V), Sahakaranagara (P), Bangalore - 92.
NAME OF THE WORK	Improvements to roads and drain in extension area in Ward No.08, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/E-PMT/22/2015-16 Dated: 20.04.2015
SAMPLE I/D	Roads in extension area in Ward No.08, BBMP, Bangalore.
DATE OF TESTING	18.05.2016



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	473.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	26.50
7. Bitumen content in %	4.90	5.30
8. Average	5.10	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOB MIX
mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	33.13	6.97	6.97	93.03	90-100
4.75	256.3	53.90	60.87	39.13	35-51
2.36	35.26	7.42	68.28	31.72	24-39
1.18	45.36	9.54	77.82	22.18	15-30
0.3	47.23	9.93	87.76	12.24	9-19
0.075	35.65	7.50	95.25	4.75	3-8

SIEVE SIZE	Trail 2				JOB MIX
mm	Weight Retained, gm	% Retained	% Cumulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	32.69	6.54	6.54	93.46	90-100
4.75	259.8	51.96	58.50	41.50	35-51
2.36	58.65	11.73	70.23	29.77	24-39
1.18	45.21	9.04	79.27	20.73	15-30
0.3	36.69	7.34	86.61	13.39	9-19
0.075	42.25	8.45	95.06	4.94	3-8

Note:

- Ⓟ This test report should not be reproduced except in full, without written approval of the laboratory.
- Ⓟ The results indicated above are based on the tests carried out on the samples received in the laboratory.
- Ⓟ Any Query regarding the report must be reported within 30 days from the date of testing.

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